

INTRODUCTION: SCOPE

BEST PRACTICES: MANAGING INTERACTION BETWEEN LOCAL AUTHORITIES AND MAJOR TRAFFIC GENERATORS

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This document presents guidelines for Minnesota county engineers on how to interact with developers of “wind farms” (technically known as large wind energy conversion systems or LWECS). However, county engineers in other states, other road authorities, and wind power developers themselves also may find this information valuable. Furthermore, much of this information may be useful when a county is dealing with any other enterprise that impacts the roads under its jurisdiction.

This document focuses on road-related issues. Issues that are outside the scope of this document but may require similar interaction include wetland protection, county ditch system maintenance, and sewer and water systems.

Important: Obtain legal counsel regarding the advisability of using information in this document or in its attachments.

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LOCAL ROAD RESEARCH BOARD | VERSION 1.1 | JULY 2010

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Experience

Experience links take you to transcribed excerpts from interviews with county engineers who have experience dealing with wind power development.

Details

Details links provide in-depth information.

Sample Documents

Sample Document links take you to contractual documents including ordinances, permits, road agreements, and haul route maps.

Research

Research links take you to reports on topics relevant to wind power development.

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Traffic Calculator links take you to a tool that can be used to quantify the impact of traffic on roads.

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Requirements:

Software:

Microsoft Word, Microsoft Excel and Adobe Acrobat Reader.

An internet connection is required to read and/or download various materials.

Saving Documents:

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Document Analysis/Descriptors:

Wind Farm, Large Wind Energy Conversion Systems, LWECS, Road Agreement, Major
Traffic Generator, Traffic Calculator, County Engineer, County Board, Township Board

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To submit experiences, documents or suggestions click any of the e-mail links above to contact the technical advisory committee. The document and resources are updated on an ongoing basis and any input is appreciated.

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This document is organized according to the typical stages of wind farm development:

Stage 1: First steps

Stage 2: Preliminary tower locations are determined

Stage 3: Pre-construction meeting

Stage 4: Construction

Stage 5: Post-construction meeting

Stage 6: Operation and maintenance

Stage 7: Decommissioning

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1A. Early indicators that a wind energy project is being planned

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- 1A. Detail – Following is the typical process developers go through to plan a wind power project:
1. **Check state and national historical data** for areas with good wind resources.
 2. **Match areas of high wind with locations where there are transmission lines.** They determine who owns the transmission line and need to be sure the lines are connected to MISO [Midwest Independent Transmission System Operator] – i.e., “the grid.”
 3. **Obtain information regarding restricted areas from Minnesota DNR and U.S. Fish & Wildlife Service.**
 4. **Contact area land owners** — Developers keep this quiet because they don’t want competitors to know they’re interested in the area. Agreements with land owners are not firm; instead they ask the land owner for a several-year agreement during which they are talking with other landowners to see if they can put together the right configuration of property.
 5. **Conduct fatal flaw analysis on microwave beam paths and aircraft glide slopes.**
Note: Some counties may have beam paths reserved for future construction. Note: FAA also defines aircraft glide slope. (Continued >>)

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1A. Detail (Continued) – Following is the typical process developers go through to plan a wind power project:

6. **Set up a MET [meteorological] tower** to measure wind speed and direction — typically 3-5 years before construction. To erect the tower, the developer needs a permit from the county planning and zoning commission (P&Z). This permit is often **the first publically detectable indicator** that a developer is investigating the possibility of a wind farm. Based on the data gathered from the MET tower, the developer may or may not go forward with the project. A county engineer should ask the P&Z commission to establish a standard practice of notifying the engineer whenever MET tower permits are issued. Furthermore, since a wind farm may spread over several counties or even several states, county engineers should also request the same kind of notification from P&Z’s in neighboring counties. **Erection of a MET tower is a good time for a county engineer to establish contact with the developer.** The developer will want to know the county’s policies regarding assessment for road use, driveway placement, tile line maintenance, current condition of roads and bridges, spring load limits, etc. The county highway engineer should ask which haul routes the developer has in mind. The county engineer also may be able to plan (or delay) road improvements to work in synch with the wind tower development.

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1A. Detail (Continued) – Following is the typical process developers go through to plan a wind power project:

7. **File for a PUC Large Wind Energy Conversion System (LWECS) permit** — typically 6 months to 2 years before construction. The Minnesota PUC usually takes 6-12 months to issue a permit, and permits are good for 3 years, so developers only take this step if they're very confident they will build. The threshold for requirement of this permit is a generating capacity of 5 Megawatts [MW] or more. In Minnesota, when the PUC issues a permit for an LWECS, the PUC's authority supersedes planning, zoning, and permitting requirements of local government entities. Permits for generators below 5 MW are issued by local authorities. However, for generators from 5 to < 25 MW, if a county board passes a resolution and notifies the PUC, the PUC may delegate authority to a county. Typically, other permits are also required.
8. **Obtain a power purchase agreement**, typically with a MISO-connected transmission company. At this point, it's pretty sure that the project will be built.

Other possible indicators that a wind farm is being planned:

- Issuance of a Certificate of Need (CON) by the Public Utilities Commission for an overview of the CON process. [\[Download\]](#)
- Notice posted by the Minnesota Environmental Quality Board <http://www.eqb.state.mn.us/>.

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SAMPLE DOCUMENTS

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1A. Sample Document:

- Typical LWECS application to the PUC:
Lakefield Wind Project, Jackson County, MN [\[Download\]](#)

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- 1B. County contacts developer to begin planning road use

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1C. Developer and county designate contact persons

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1C. Experience – Interview with Nobles County, Minnesota, Engineer Steve Schnieder:

“We asked the developer to assign one person as the contact person if we want to have any dialogue with them. That’s so we hear a consistent story at all times.

The next step is to have someone who is the main contact for the prime contractor who will be responsible for everyone doing their job. Generally you don’t want to go any further down the line than that. But in real life, there are times when you’ll need to talk with the subcontractor because there isn’t time to contact the prime contractor. So again, you want to have one foreman or other person on the job site who has authority.

We have had situations where you have an agreement with the developer and prime contractor that you’re only going to use a certain roadway to haul materials into the project – and you have an agreement that they will do dust control on the road. But then the guy comes in to do his job, and someone has neglected to tell him he needs to do dust control or he’s using the wrong road. And you’re getting a call from a citizen complaining of the dust. So you might have to stop a truck on the road or meet them at the pit or other location. If they refuse to comply, you call the sheriff. That usually works. We’ve done that; we’ve requested a deputy to come out and that usually works.”

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1C. Detail: Contact Person

The county typically designates its county engineer or planning and zoning director. The developer should designate a single person who will be responsible for all major decisions. At the same time, the developer should provide contact information for all contractors and subcontractors who may be called upon to make smaller decisions.

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1D. Schedule early planning meetings and define agenda items for these meetings

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1D. Detail: Meeting

Ideally, all listed items should be addressed in the first meeting. However, typically, a series of meetings is needed to develop details.

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1D1. County provides road jurisdiction maps and AADT maps

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1D1. Detail: AADT Maps

Developer uses these maps to determine access routes.

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1D2. Define project boundary

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1D3. Define project schedule

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1D3. Detail: Schedule

The county should use this schedule to determine how development will impact the county’s work load. The schedule should include dates by which developer needs various permits and dates of construction events.

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1D4. Provide spring load restriction maps to developer

Note: Explain that no hauling is allowed during spring weight restriction

Note: Advise on winter load increase (approx. Dec 15-Feb 15)

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1D4. Detail: Restrictions

County may need to explain spring load restrictions and winter load increases to developers who are new to temperate climates.

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1D5. Provide developer with bridge location map and inform developer if bridge structural analysis will be needed

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1D5. Detail: Bridges

Developer must factor bridge load limits into the haul routes. The important thing (now and throughout the process) is to be proactive i.e., inform the developer early of the policy regarding who hires and who pays for bridge analysis. Possible scenarios:

1. County is confident that a given structure can handle anticipated loads so no analysis is required.
2. County hires structural consultant and charges developer for analysis.
3. County hires consultant and absorbs analysis cost.
4. Developer agrees to hire a consultant and pay for the analysis.
Note: This is a requirement in Maine.

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1D6. Provide maps of public drainage system (tile/ditch); discuss requirements; define allowable temporary and permanent changes

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STAGE 1: First Steps

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1D7. Explain your permit/fee structure

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1D7. Detail: Permit/Fee

Before a county can go further, it must decide on a methodology for assessing and recouping the costs of road damage caused by wind farm development. Four methodologies are in common use:

1. Charge per-use fees.
2. Charge a blanket “haul route” fee for the entire development project.
3. Quantify and charge for damage by calculating the number of ESALs construction activity will take out of the road’s intended life. Click **CALCULATOR** for a tool that can be used to calculate the amount of damage done to asphalt-surfaced roads by wind farm development.
4. Conduct pre- and post-construction assessments of the road, including some combination of the items listed in [2B2a \[link\]](#) through [2B2f \[link\]](#) of this document. This information allows the county to charge for the actual cost incurred to restore the road to the previous (or other agreed-upon) condition.

However, none of the above four methods can stand on its own to assess and recoup costs of road damage. Often, counties choose one method from among 1-3 above — and possibly 4 as well. But each county must define its own strategy. The steps shown in the remainder of this document may or may not apply to a given project, depending on which methodology is chosen.

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1D7. Sample Document – Examples of wind energy ordinances, road agreements, and related documents

- List of permitted wind energy projects in Minnesota since 1995, including project name, project size, and location (county):
<http://energyfacilities.puc.state.mn.us/Docket.html?searchSubject=Wind+power&searchStatus=permitIssued&searchCoverage=&B1=Submit>
- List of proposed projects in Minnesota that are in the permitting process as of April 2010:
<http://energyfacilities.puc.state.mn.us/Docket.html?searchSubject=Wind+power&searchStatus=openProjects&searchCoverage=&B1=Submit>
- **Dekalb County, Illinois, road agreement** —
[Download] This is an undated draft agreement containing provisions requiring the developer to provide a site layout plan and to pay for any road damage caused by construction traffic. Section 1 references the approval of a site layout plan, which includes project site access roads. Section 4 details the developer's obligation to repair county roads. This agreement calls for an independent road survey to be conducted before and after construction to determine the condition of the roads and to calculate any damage.
- **Dodge County, Minnesota, crane crossing requirements** [Download]
- **Jackson County, Minnesota, driveway permit application** [Download]
- **Jackson County, Minnesota, moving permit application** [Download]
- **Jackson County, Minnesota, radius extension permit application** [Download]
- **Jackson County, Minnesota, utility permit application** [Download]

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1D7. Sample Document (Continued) – Examples of wind energy ordinances, road agreements, and related documents

- **Klickitat County, Washington, wind development policy and agreement** — includes provision for a bond to cover potential financial impacts from a wind farm project: [\[Download\]](#) Extract: “Klickitat County Public Works commented on the application February 25, 2008, stating the road bond being calculated in the MDNS might be low (\$70,000 a mile of paved County road and \$20,000 a mile of gravel County road). Additionally, the access to the O & M building shall be at a minimum 20 feet wide with adequate drainage and structural section to provide year round access without increasing County maintenance. Conditions have been imposed to this effect. “
- **Lee County, Illinois, road agreement** [\[Download\]](#)
- **Lincoln County, Minnesota, driveway application / policy** [\[Download\]](#)
- **Logan County, Illinois, zoning ordinance**, Appendix E, Wind Energy Conversion Systems — [\[Download\]](#) — This zoning ordinance details the requirements for wind farm development in Logan County, Ill. Section V.L., “Use of Public Roads,” describes the duties of developers in relation to the use of local roads and infrastructure, and details the requirements regarding road identification: “Any proposed public roads that will be used for construction purposes shall be identified and approved by the respective Township Road Commissioner and the County Engineer prior to the granting of the Conditional Use Permit. Traffic for construction purposes shall be limited to these roads. All overweight and/or oversized loads to be transported on public roads will require a permit from the respective highway authority.” (page 5) The ordinance also addresses developers’ responsibility for repairs to any road damage that may occur.
- **Logan County, Illinois, road agreement** [\[Download\]](#)
- **Logan County Illinois road agreement** Exhibit A: Haul Route Map [\[Download\]](#)

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1D7. Sample Document (Continued) – Examples of wind energy ordinances, road agreements, and related documents

- **Logan County, Illinois, road agreement**, Exhibit B: Road Reshaping Requirements [\[Download\]](#)
- **Logan County, Illinois, zoning ordinance**, Appendix E: Wind Energy Conversion Systems: [\[Download\]](#) This zoning ordinance details the requirements for wind farm development in Logan County, Ill. Section V.L., “Use of Public Roads,” describes the duties of developers in relation to the use of local roads and infrastructure, and details the requirements regarding road identification: “Any proposed public roads that will be used for construction purposes shall be identified and approved by the respective Township Road Commissioner and the County Engineer prior to the granting of the Conditional Use Permit. Traffic for construction purposes shall be limited to these roads. All overweight and/or oversized loads to be transported on public roads will require a permit from the respective highway authority.” (page 5). The ordinance also addresses developers’ responsibility for repairs to any road damage that may occur.
- **Maine county (unnamed) wind energy development road agreement:** [\[Download\]](#)
- **McLean County, Illinois, road upgrade and maintenance agreement** — <http://co.mclean.il.us/boardnotes/> — Click on Past Agenda and Minutes 2005; Scroll down to Transportation Committee and click on Attachments for September. The road agreement is found on pages 3-31. This agreement contains provisions requiring the developer to pay for the cost of any damage caused by construction traffic. It also contains the requirement for a pre- and post-construction joint survey to determine the damage to the roads. The method in this agreement is both joint inspection and videotaping the roads to be used. Exhibit B includes provisions requiring the developer to make improvements to existing county roads before and after construction (pages 23-31). Details about specific improvements and the costs associated with these improvements are also given.

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1D7. Sample Document (Continued) – Examples of wind energy ordinances, road agreements, and related documents

- **Montana wind energy ordinance** [Montana Annotated Code 2009, section 15-24-3004.; <http://data.opi.mt.gov/bills/mca/15/24/15-24-3004.htm>]. Excerpt: (1) An owner or operator of a wind generation facility used for a commercial purpose is subject to an initial local governmental and local school impact fee for the first 3 years after construction of the wind generation facility begins. The impact fee may not exceed 0.5% of the total cost of constructing the wind generation facility.

Two news articles provide details on how these fees have been implemented:
“County Road Dept. to Receive \$100,000 from Wind Farm Impact Fees Payment,” August 19, 2008. [[Download](#)]

“Giant Shelby-Area Wind Farm Gears Up,” July 18, 2008. [[Download](#)]
Excerpt: “Toole County Commissioner Allan Underdal said tax revenue in that county from the Glacier Wind Farm will be \$2.1 million its first year of operation. This year, the county will charge NaturEner a \$437,000 impact fee to cover services the county supplies for the project, such as roadwork and public safety.”

- **Morrison, Wisconsin: Large and Small Wind Energy Facility Ordinance**, adopted May 13, 2008. [[Download](#)]
- **Murray County, Minnesota, wind energy ordinance** [[Download](#)]

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1D7. Sample Document (Continued) – Examples of wind energy ordinances, road agreements, and related documents

- **Nicollet County Wind Energy Conversion Systems Ordinance**, Nicollet County, Minnesota, August 2009. [\[Download\]](#) This is an ordinance recently passed in Nicollet County, Minn., dealing with the siting of wind farms. Section 909.1, “Avoidance and Mitigation of Damages to Public Infrastructure,” and Section 909.2, “Roads,” include provisions dealing with the impact on local roads, sign relocation, drainage system impact and traffic plans. The following provision addresses developers’ responsibility for identifying roads to be used to haul materials and equipment: “Identify all public roads to be used for the purpose of transporting [wind energy conversion systems], substation parts, materials and/or equipment for construction, operation or maintenance of the WECS and obtain applicable weight and size permits from the impacted road authority(ies) prior to construction.” (page 17)

A related provision addresses road restoration requirements: “Provide a bond, in an amount determined by the road authority, to be held by the County until the Township and/or County road authority(ies) have provided the County Auditor-Treasurer with a written release that all haul routes within their jurisdiction in Nicollet County have been returned to preconstruction condition.” (page 18)

- **New York local government laws/zoning provisions on wind energy** — examples: NYS Energy Research and Development Authority, October 2005. [\[Download\]](#) This toolkit provides an overview of existing local laws and zoning ordinances in New York state dealing with the siting of wind energy facilities. Some examples include sections dealing with existing roads, the requirement for road repair or construction, and the impact of wind farm construction on local infrastructure. For example: “The applicant is responsible for remediation of damaged roads upon completion of the installation or maintenance of a WECS. A public improvement bond shall be posted prior to the issuance of any building permit in an amount determined by the Town Board, sufficient to compensate the Town for any damage to local roads.” (pages 45-46) (Continued >>)

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SAMPLE DOCUMENTS

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1D7. Sample Document (Continued) – Examples of wind energy ordinances, road agreements, and related documents

- **Nobles County, Minnesota, wind tower development agreement with EnXco** — includes Exhibit E: Road Use and Repair Agreement and Exhibit F: Public Drainage System Protection Agreement [[Download](#)]. Note: This agreement has been vetted by attorneys on both sides of the agreement.
- **Nobles County, Minnesota, irrevocable letter of credit** — include credit rating document for bank that issued the letter of credit [[Download](#)]
- **Nobles County, Minnesota, sample township agreement for wind farm development** [[Download](#)]
- **Oregon Department of Energy: Model Ordinance for Energy Projects**, July 2005. - [[Download](#)]. The Oregon Department of Energy prepared this document to assist local communities in dealing with siting all types of energy projects, including wind farm development. It contains model language dealing with all aspects of new energy facilities, including a short section on the use of local roads. Pages 20-23 include examples that deal with the use of and damage to public roads, erosion and sediment control, and wetland protection.
- **Rock County, Minnesota, driveway ordinance** [[Download](#)]
- **Sodus Township, Lyon County, Minnesota wind farm development agreement** [[Download](#)]
- **Watsonwan County, Minnesota, driveway policy** [[Download](#)]

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1D7. Research – Road deterioration, methods for assessing road damage, etc.

- **Method for Assessing Heavy Traffic Impacts on Gravel Roads Serving Oil- and Gas-Drilling Operations**, George Huntington, Khaled Ksaibati, Transportation Research Record: Journal of the Transportation Research Board, No. 2101, 2009: 17-24.
Abstract: <http://ntlsearch.bts.gov/tris/record/tris/01123122.html> The paper discusses a three-year asset management project looking at three county road systems in Wyoming experiencing significant impact from oil and natural gas drilling activities. One of the goals of the project was to determine the impact of heavy drilling trucks associated with those activities on local county roads. From the abstract: “Clearly, the heavy traffic associated with drilling activities has significantly damaged these three counties’ roads beyond what would be anticipated from typical traffic loads. The proposed method could easily be adapted to other road systems experiencing a significant influx of heavy truck traffic to assess the impact of the additional traffic.”
- **Modeling the Response of Paved Low-Volume Roads Under Various Traffic and Seasonal Conditions**, Nabil Suleiman, Amiy Varma, Transportation Research Record: Journal of the Transportation Research Board, No. 1989, 2007: 230-236.
Abstract: <http://ntlsearch.bts.gov/tris/record/tris/01051242.html> This paper discusses the deterioration of paved low-volume roads in North Dakota due to increased truck traffic. According to the authors, “[t]he traditional empirical methods—use of the soil factor and R-value designs and the use of visual inspection and ride quality—to assess pavement performance are not adequate.” To obtain a better understanding of the impact of increased truck traffic on the low volume roads, “[a] three-dimensional finite element program is used to model the pavement response in the form of total permanent deformation (TPD) and to calculate axle and truck damage factors.” Using the TPD response the authors are able to analyze pavement responses under different vehicle weights and seasonal conditions.
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1D7. Research (Continued)– Road deterioration, methods for assessing road damage, etc.

- **Infrastructure Costs Attributable to Commercial Vehicles**, Maria Boile, Kaan Ozbay, Preethi Narayanan, Edward S. Kondrath, New Jersey Department of Transportation, 2001. Abstract: <http://cait.rutgers.edu/research-reports/infrastructure-costs-attributable-commercial-vehicles> . This report summarizes a comprehensive study of the infrastructure impacts of heavy vehicles. The report reviews a federal highway cost allocation study along with studies from Arizona, Oregon, Indiana, Georgia and Minnesota. Beginning on page 20, the report discusses five traditional deterioration models: statistical, subjective, empirical, mechanistic/empirical and mechanized. The authors also describe different computer software models used to evaluate pavement deterioration, including the Mathematical Model of Pavement Performance, Highway Design and Maintenance Standards Model (HDM IV) and PAVESIM. The different input requirements and measurement outputs are discussed for each model.
- **Allocation of Pavement Damage Due to Trucks Using a Marginal Cost Method**, J. J. Hajek, S. L. Tighe, B. G. Hutchinson, Transportation Research Record: Journal of the Transportation Research Board, No. 1613, 1998: 50-56. Abstract: <http://ntlsearch.bts.gov/tris/record/tris/00755053.html> . This research deals with assessing pavement cost allocation using the marginal cost method. The paper discusses how this method “can be used to quantify pavement damage due to any axle load combination for both new and existing, in-service pavements.” For example, this method could be used to “quantify the pavement costs associated with increasing allowable truck weights of logging trucks on a specific segment of the highway network.” (Continued >>)

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1D7. Reasearch (Continued)– Road deterioration, methods for assessing road damage, etc.

- **Taxing Development: The Law and Economics of Traffic Impact Fees**, Jack Estill, Benjamin Powell, Edward Stringham, Public Interest Law Journal, Vol. 16, 2006: 1-37. [\[Download\]](#) This article discusses the history, theory and legality of charging developers a fee based upon the impact their development has on public infrastructure and services. Section II, beginning on page 3, discusses the legal history of impact fees. The analysis provides a detailed history of the legal precedents allowing governments to use such fees. The article is focused on the legal issues surrounding impact fees and gives a broad outline of the history and policy behind their use.
- **Policy Options for Truck User Charging**, Alison J. Conway, Michael C. Walton, TRB Annual Meeting, DVD, 2009. Abstract: <http://ntlsearch.bts.gov/tris/record/tris/01122180.html>
From the abstract: : “This paper provides a review of truck road user charging mechanisms employed worldwide. The purpose of this study is to identify the variables currently considered in determining user charge rates for heavy trucks within different tolling structures, and to determine the relationship of these variables to policy goals.”

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1D7a. Driveways

1D7b. Utilities

1D7c. Moving permits or haul route permits

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1D7a. Sample Document: Driveways

- Jackson County, Minnesota, driveway permit application [\[Download\]](#)

1D7b. Sample Document: Utilities

- Jackson County, Minnesota, utility permit application [\[Download\]](#)

1D7c. Sample Document: Moving permits or haul route permits

- Jackson County, Minnesota, moving permit application [\[Download\]](#)

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1D7d. Work in ROW

- Widen intersections
- Dedication of sight corners (at county's option)
- Temporary relocation of signage, including all previously existing regulatory and informational signs

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1D7d. Detail: Widen intersections

To accommodate wide turning radii of large vehicles, material may need to be added to inside corners. The county should require the developer to

1. Acquire any easements from adjacent landowners that are needed to widen the corner beyond the existing ROW.
2. Address and perpetuate drainage.

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1D7e. Radius extension permits

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1D7e. Sample Document: Radius extension permit

- Jackson County, Minnesota, radius extension permit application [\[Download\]](#)

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1D7f. Other county-specific permits

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1D8. County provides developer with a draft road agreement

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1D8. Sample Document: County provides developer with a draft road agreement

- **Nobles County, Minnesota, wind tower development agreement with EnXco** — includes Exhibit E: Road Use and Repair Agreement and Exhibit F: Public Drainage System Protection Agreement [[Download](#)]. Note: This agreement has been vetted by attorneys on both sides of the agreement.

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1D8. Experience – Interviews with county engineers:

- **Logan County, Illinois, Engineer Bret Aukamp** (217) 732-3059: “Logan County has one operating wind farm, and the county secured a road agreement with the developer prior to construction. The agreement covered road upgrades prior to construction, road surveys and a requirement to return the roads to their pre-construction condition after development.”
- **McLean County, Illinois, Engineer Eric Schmitt** (309) 663-9445: “McLean County currently has one wind farm operating and one planned for next year. The county’s zoning ordinance requires the engineer to obtain a road agreement with wind farm developers. The requirement is part of the process to obtain a special use permit. The road agreement that McLean County made with the wind developer includes provisions for repairing any damage to the roads caused by the construction of the wind farm and also contains provisions that require the developer to improve roads before they begin construction. Mr. Schmitt said that he thought the development of the wind farm was a net positive for the county road system because the county was able to negotiate significant improvements to the road system that it would not otherwise have been able to accomplish.”
- **Murray County, Minnesota, Engineer Randy Groves** (507) 836-6327: “Murray County has several wind farms. According to Mr. Groves, initially the counties did not find out about a wind farm development until the county received requests for heavy vehicle permits. The fees the county receives for the issuance of heavy vehicle permits have historically been the only way the county recovered any costs of road damage caused by heavy vehicles used in connection with the development of wind farms. None of the wind farms built in Murray County had a road agreement associated with it that would require the developer to rebuild damaged roads. This is of great concern to Mr. Groves. He is concerned about widening intersections for passage of the vehicles and the damage overweight vehicles can do to the road. The concerns he expressed have been dealt with in other counties by requiring a road agreement between the developer and the county before construction of the wind farm is permitted. Mr. Groves would like to see a more uniform way the counties can deal with wind developers in order to protect local interests.” (Continued >>)

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1D8. Experience (Continued) – Interviews with county engineers:

- **Nobles County, Minnesota, Engineer Steve Schnieder:** I’ve been telling the developers that we’ll have a road agreement – and that it will only deal with the roads we have jurisdiction over. So we tell them that they will need to have similar agreements with townships, cities, other counties, or the state to use their roads. But we’re trying to use a standard format and hope that all entities will use the same basic form of the agreement. It spells out the responsibilities and what remedies will be taken and so forth.”
- **Richland County, Ohio, Deputy Engineer Tim Lichtenwalter** (419) 774-5808: “Richland County is currently drafting a road agreement pertaining to the development of a local wind farm. Mr. Lichtenwalter described how his county looked to several counties in Indiana to figure out how to deal with wind farm development and the resulting impact on the local road system. According to Mr. Lichtenwalter, the agreement the county reached with the developer will include provisions for road upgrades prior to construction, pre-construction road assessments and cost recovery for any damage done to the local roads. The goal of the road agreement is to require the developer to be responsible for all costs associated with the development of the wind farm.”

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1D9. County discusses remedies to be taken if regulations are not followed

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1D9. Detail: Remedies

If the developer is allowed to erect roadblocks, signage, etc., it is important to define legal remedies to be taken if developer does not follow approved methods (e.g., Minnesota Manual of Uniform Traffic Control Devices) and this leads to a collision or other problem.

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- 1D10. County informs developer that developer must obtain all other permits required by agencies such as DNR, US Fish & Wildlife, MNPCA, the county planning and zoning commission, and township boards

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1E. County notifies townships; set work session(s) with township officials

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1E. Detail: Work Session

Often, the county engineer informs the township officials about the project (if they are not yet aware of it). Then the engineer schedules a meeting with all township officials or meetings with the officials of an individual township to explain how the county is and will be handling the various permitting and road use issues. A township may decide either to handle permitting itself or to cede its jurisdiction over the developer to the county and ask the county engineer to take care of everything for the township.

Townships may either become part of the overall county-developer agreement or may reach direct agreements with the developer.

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1E. Experience: Interview and Issues Addressed

Interview with Nobles County, Minnesota, Engineer Steve Schnieder: “Nobles County developed a one-page agreement that the townships could use when they were developing the transmission lines taking power away from the wind farms. It allows them to fill in the blanks – for so many yards of gravel, what the quality of the gravel will be, and when it’s to be done, and any other requirements for restoring the roadway. Then we had both parties sign off on the document and give us a copy. We did that because, in the past, we’ve had situations where townships and developers have entered into an agreement but haven’t given us a copy of the agreement — and then the township would come back and ask us to mediate for some reason. But we wouldn’t know how to be fair if we didn’t have a copy of the agreement. So on our contracts, we require that the developer has a signed agreement with the township and that we have a copy of it. Then we know if they’ve lived up to their agreement with the township.

Now we have developed a more comprehensive document. It deals with tile lines, extra driveways, and wider driveways. There’s almost guaranteed to be damage to the road as the project goes along. The document defines maintain the roadway during the project — and they’re going to go back and restore the roads after the project is done. That agreement is probably going to stand up better in court if it’s challenged.

However, anyone who uses that agreement will need to conform it to their needs. Issues to be addressed include:

Tile lines: Before construction, should the developer replace all tile lines under haul routes with stronger material? Or is it OK to wait and see if there are problems and then fix them? Another strategy is to make the developer responsible for repairing any problems that occur with a tile line within a specified period after construction — perhaps 3 or 5 years. (Continued>>)

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1E. Experience: Interview and Issues Addressed (Continued)

Dust control. Does it need to be done only in front of the residences? If so, how far beyond the property line must the material be applied— 100 or 200 feet?” We require 100% dust control on the whole road. It’s not just the breathing of dust; it’s a safety issue if you can’t see down the road. You also have farmers saying the pollination process or photosynthesis is being impeded by the dust. Requiring 100% dust control on gravel roads tends to force contractors onto paved roads, which are usually safer and stronger. But this will impact the contracts that the prime contractor signs with haulers. Depending on where gravel pits are, one hauler might be able to do a job cheaper than another just because dust control might be needed on one route and not another. So the contractors want to know that kind of thing up front so they can factor it into their bidding process.

Pot holes. Who’s going to patch them and how long before they have to be fixed? And on a gravel road: How often do they have to go out and reshape the road? Once a day? Twice a day? Three times? Or let’s say it’s raining. Then how often do they have to put gravel on the road? And how much? You might say they have to respond within an hour of a complaint. And who’s empowered to say it’s needed? The county engineer? The township officials? So you want to specify that.

Mud on the road. If a contractor tracks mud all over the road, who’s going to scrape the mud off? And do they need to do it right away? Or do they have to do it every two hours? All these things relate to public safety. The road has to be passable for the people who live on the road. We require the contractor to keep the road passable at all times.” (Continued>>)

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1E. Experience: Interview and Issues Addressed (Continued)

Signage. Who’s going to put the signs up and who’s going to maintain them during construction? We used to say it’s the contractor’s responsibility. But now we say exactly how we want them to do it — so now it’s a bid item. If we give the responsibility to the contractor, then they accept all liability for the signage too. Then when the project is completed, the county might have the responsibility of putting the permanent signs back up. Or you might decide that the county will take charge of all signs during and after the project because you’re sure the county will do it according to the MMUTCD. And there’s the question: Can we put something in writing that protects us in case of a lawsuit? Chances are, if there’s a crash, the county will be named in a lawsuit no matter what, so, to protect yourself, you might just as well make sure the signage was done right.”

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1F. Contact other counties affected by the project and coordinate with them

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Stage 2. Experience: Preliminary tower locations are determined

Wind generator developers typically start with a list of potential tower sites, and then delete sites from the list due to problems such as proximity to a wetland or setback requirements. For example, in Jackson County, a developer started with a list of 150 potential sites, and ended up with 134 sites.

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- 2A. Preliminary identification of haul routes for all materials (tower components, gravel, concrete, steel, etc.) as well as driveway and utility locations

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2A. Detail: Tower Components

Major components of a typical large wind generator: Large tower sections, nacelle (containing the generator), blades, and hub that the blades are attached to. The goal here is to predict the size, weight, and number of all loads on each road. This allows the county engineer to watch the most heavily used roads for damage as the project goes along. However, a developer may not be able to precisely predict the number of loads needed for a given project. The tower components contribute to road deterioration, but most road deterioration is due to hauling the gravel, concrete, and rebar that go into the tower base. Typically, these are legal loads and yet, it has been seen in many cases that the high number of these loads eventually results in road deterioration.

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2B. Create structure inventory

At this stage, it is essential that the county and the developer agree on the methodology to be used to charge the developer for all damage done during the project. Click **Calculator** for a tool that you can use to quantify the loads.

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2B1. Bridges – county chooses one of these options:

- County performs and county pays
- County performs and developer pays
- County agrees that developer will use its contractor; developer pays contractor

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2B2. Road condition survey: County chooses a method for assessing and charging for road deterioration, which could include:

- 2B2a. Video survey alternatives
- 2B2b. Shoulder Profile Index (PI)
- 2B2c. Pavement PI
- 2B2d. Cross sections
- 2B2e. Falling Weight Deflectometer (FWD)
- 2B2f. Cores and/or ground-penetrating radar to confirm structural analysis

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2B2. Sample Document: Road Condition Survey

See 1D7 for document examples of ordinances, policies, road agreements, and permits from various jurisdictions.

[Go to 1D7>>](#)

Click **Calculator** for a tool that can be used to calculate the amount of damage done to asphalt-surfaced roads by wind farm development.

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2B2a. Video survey alternatives:

- Mn/DOT’s pavement management service
- County contracts for video on its own

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2B2a. Detail: Video Survey

To make pavement management video data useful, pavement must be marked with location indicators before video is done.

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2B2b. Shoulder Profile Index (PI)

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2B2c. Pavement PI

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2B2d. Cross sections

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- 2E3d.

2B2e. Falling Weight Deflectometer (FWD)

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2A.
2B.
2B1.
2B2.
2B2a.
2B2b.
2B2c.
2B2d.
2B2e.
2B2f.<
2C.
2D.
2E.
2E1.
2E2.
2E3.
2E3a.
2E3b.
2E3c.
2E3d.
- 2B2f. Cores and/or ground-penetrating radar to confirm structural analysis

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- 2B2.
- 2B2a.
- 2B2b.
- 2B2c.
- 2B2d.
- 2B2e.
- 2B2f.
- 2C.**
- 2D.
- 2E.
- 2E1.
- 2E2.
- 2E3.
- 2E3a.
- 2E3b.
- 2E3c.
- 2E3d.

2C. Notify affected township boards

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SAMPLE DOCUMENTS

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2C. Sample Document: Notify Affected Township Boards

- **Lee County, Illinois, road agreement** [[Download](#)]
- **Logan County, Illinois, road agreement** [[Download](#)]
- **Logan County Illinois road agreement Exhibit A: Haul Route Map** [[Download](#)]
- **Logan County, Illinois, road agreement, Exhibit B: Road Reshaping Requirements** [[Download](#)]
- **Maine county (unnamed) wind energy development road agreement:** [[Download](#)]
- **McLean County, Illinois, road upgrade and maintenance agreement** — <http://co.mclean.il.us/boardnotes/> — Click on Past Agenda and Minutes 2005; Scroll down to Transportation Committee and click on Attachments for September. The road agreement is found on pages 3-31. This agreement contains provisions requiring the developer to pay for the cost of any damage caused by construction traffic. It also contains the requirement for a pre- and post-construction joint survey to determine the damage to the roads. The method in this agreement is both joint inspection and videotaping the roads to be used. Exhibit B includes provisions requiring the developer to make improvements to existing county roads before and after construction (pages 23-31). Details about specific improvements and the costs associated with these improvements are also given.
- **Nobles County, Minnesota, sample township agreement for wind farm development** [[Download](#)]

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2B2a.
2B2b.
2B2c.
2B2d.
2B2e.
2B2f.
2C.
2D. <
2E.
2E1.
2E2.
2E3.
2E3a.
2E3b.
2E3c.
2E3d.

2D. Finalize road agreement

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- 2B2d.
- 2B2e.
- 2B2f.
- 2C.
- 2D. <**
- 2E.
- 2E1.
- 2E2.
- 2E3.
- 2E3a.
- 2E3b.
- 2E3c.
- 2E3d.

2D. Sample Document: Finalize Road Agreement

- **Nobles County, Minnesota, wind tower development agreement with EnXco** — includes Exhibit E: Road Use and Repair Agreement and Exhibit F: Public Drainage System Protection Agreement [[Download](#)]. Note: This agreement has been vetted by attorneys on both sides of the agreement.

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2B2a.
2B2b.
2B2c.
2B2d.
2B2e.
2B2f.
2C.
2D.
2E. <
2E1.
2E2.
2E3.
2E3a.
2E3b.
2E3c.
2E3d.

2E. The developer must provide a traffic plan, which must be approved by the county engineer. The traffic plan may be appended to the road agreement. The traffic plan should include:

- 2E1. Definition of number and size of all construction loads, including concrete, gravel, rebar, and tower components
- 2E2. Definition of which road segments will be used, including all CSAH's, CR's, and TWP's
- 2E3. Signage for road closure and detours

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- 2B2f.
- 2C.
- 2D.
- 2E.
- 2E1. <
- 2E2.
- 2E3.
- 2E3a.
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- 2E3d.

2E1. Definition of number and size of all construction loads, including concrete, gravel, rebar, and tower components

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- 2B2e.
- 2B2f.
- 2C.
- 2D.
- 2E.
- 2E1.
- 2E2. <
- 2E3.
- 2E3a.
- 2E3b.
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- 2E3d.

2E2. Definition of which road segments will be used, including all CSAH’s, CR’s, and TWP’s

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- 2B2f.
- 2C.
- 2D.
- 2E.
- 2E1.
- 2E2.
- 2E3. <
- 2E3a.
- 2E3b.
- 2E3c.
- 2E3d.

2E3. Signage for road closure and detours

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 - 2B2e.
 - 2B2f.
 - 2C.
 - 2D.
 - 2E.
 - 2E1.
 - 2E2.
 - 2E3.
 - 2E3a.**
 - 2E3b.
 - 2E3c.
 - 2E3d.
- 2E3a. A statement that all signage must meet the requirements of Minnesota Manual of Uniform Traffic Control Devices, Section 6, “Standards and Guides for Traffic Controls for ... Construction....”

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2B2d.
2B2e.
2B2f.
2C.
2D.
2E.
2E1.
2E2.
2E3.
2E3a.
2E3b.<
2E3c.
2E3d.

2E3b. A statement about who will manage signage (including temporary relocation of all previously existing regulatory and informational signs) and who will pay for the work.

Options:

- County performs – county pays
- County performs – contractor pays
- Contractor performs – contractor pays

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- 2E2.
- 2E3.
- 2E3a.
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- 2E3d.

2E3b. Sample Document: County performs – contractor pays

- Jackson County, Minnesota, radius extension permit application [\[Download\]](#)

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- 2B2f.
- 2C.
- 2D.
- 2E.
- 2E1.
- 2E2.
- 2E3.
- 2E3a.
- 2E3b.<
- 2E3c.
- 2E3d.

2E3b. Detail: Who will manage signage and who will pay for the work.

This includes all temporary regulatory and informational signs used for road closure, detours, and construction warning.

2E3b. Detail: Contractor performs – contractor pays

If the 3rd option (Contractor performs – contractor pays) is agreed upon, two major issues arise:

- 1. How do you assure public safety?
- 2. Who is liable if there is negligence that leads to a problem?

For example, who will be held responsible if the contractor does not replace a stop sign and this negligence causes or contributes to a collision or other harmful incident? Each county engineer must decide how to handle this issue.

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 - 2B2c.
 - 2B2d.
 - 2B2e.
 - 2B2f.
 - 2C.
 - 2D.
 - 2E.
 - 2E1.
 - 2E2.
 - 2E3.
 - 2E3a.
 - 2E3b.
 - 2E3c.**
 - 2E3d.
- ## 2E3c. A statement that, when roads are to be closed, the responsible contractor will notify:

 - County engineer
 - County law enforcement dispatch
 - County emergency services (911)
 - Impacted school districts
 - U.S. Post Office

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2B2.
2B2a.
2B2b.
2B2c.
2B2d.
2B2e.
2B2f.
2C.
2D.
2E.
2E1.
2E2.
2E3.
2E3a.
2E3b.
2E3c.
2E3d.<

2E3d. A statement whether flaggers and/or signs are required for detours while equipment is being moved

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STAGE 3: Pre-Construction Meeting

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3. <

3A.

3B.

3C.

3D.

3D1.

3D2.

3D3.

3D4.

3E.

3F.

3F1.

3F2.

3F3.

3G.

3G1.

3G2.

3G3.

3G4.

3G5.

Stage 3. Pre-construction meeting

At this point, all elements below should be completed and signed off by the county engineer.

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3. < **Stage 3. Detail: Pre-construction meeting.**

- 3A.
- 3B.
- 3C.
- 3D.
- 3D1.
- 3D2.
- 3D3.
- 3D4.
- 3E.
- 3F.
- 3F1.
- 3F2.
- 3F3.
- 3G.
- 3G1.
- 3G2.
- 3G3.
- 3G4.
- 3G5.

The pre-construction meeting typically occurs in the spring. At this time, the developer often hands off responsibility to those who will construct the project. Therefore, the county engineer must be vigilant to be sure the construction people understand and observe all agreements reached up to this point. The county engineer should make it clear that, if a contractor feels their bid did not include or foresee something the developer has agreed to with the county, the contractor needs to take up the issue with the developer – not with the county.

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STAGE 3: Pre-Construction Meeting

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- 3.
- 3A. <
- 3B.
- 3C.
- 3D.
- 3D1.
- 3D2.
- 3D3.
- 3D4.
- 3E.
- 3F.
- 3F1.
- 3F2.
- 3F3.
- 3G.
- 3G1.
- 3G2.
- 3G3.
- 3G4.
- 3G5.

3A. Road agreement

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STAGE 3: Pre-Construction Meeting

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- 3.
- 3A.
- 3B.** <
- 3C.
- 3D.
- 3D1.
- 3D2.
- 3D3.
- 3D4.
- 3E.
- 3F.
- 3F1.
- 3F2.
- 3F3.
- 3G.
- 3G1.
- 3G2.
- 3G3.
- 3G4.
- 3G5.

3B. Structure inventory

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3.
3A.
3B.
3C. <
3D.
3D1.
3D2.
3D3.
3D4.
3E.
3F.
3F1.
3F2.
3F3.
3G.
3G1.
3G2.
3G3.
3G4.
3G5.

3C. Traffic plan – final haul routes identified for all materials/loaded and unloaded hauls

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STAGE 3: Pre-Construction Meeting

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- 3A.
- 3B.
- 3C.
- 3D. <
- 3D1.
- 3D2.
- 3D3.
- 3D4.
- 3E.
- 3F.
- 3F1.
- 3F2.
- 3F3.
- 3G.
- 3G1.
- 3G2.
- 3G3.
- 3G4.
- 3G5.

- 3D. Permits
 - 3D1. Driveway locations
 - 3D2. Utility locations
 - 3D3. Work in ROW – e.g., intersection widening
 - 3D4. Moving

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STAGE 3: Pre-Construction Meeting

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- 3.
- 3A.
- 3B.
- 3C.
- 3D.
- 3D1.
- 3D2.
- 3D3.
- 3D4.
- 3E.** < Identify general contractor's points of contact.
- 3F.
- 3F1.
- 3F2.
- 3F3.
- 3G.
- 3G1.
- 3G2.
- 3G3.
- 3G4.
- 3G5.

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STAGE 3: Pre-Construction Meeting

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3D.
3D1.
3D2.
3D3.
3D4.
3E.
3F. <
3F1.
3F2.
3F3.
3G.
3G1.
3G2.
3G3.
3G4.
3G5.
- 3F. Provide lists of all:

3F1. Subcontractors and their roles in the project

3F2. Suppliers

3F3. Shippers

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- 3.
- 3A.
- 3B.
- 3C.
- 3D.
- 3D1.
- 3D2.
- 3D3.
- 3D4.
- 3E.
- 3F.
- 3F1.** <
- 3F2.
- 3F3.
- 3G.
- 3G1.
- 3G2.
- 3G3.
- 3G4.
- 3G5.

3F1. Detail: Subcontractors and Their Roles in the Project

The fact that the general contractor lists all subcontractors and defines their roles does not mean the county should now deal with the subcontractors. The general contractor should become the single point of contact with the county.

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3.
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3B.
3C.
3D.
3D1.
3D2.
3D3.
3D4.
3E.
3F.
3F1.
3F2.
3F3.
3G. <
3G1.
3G2.
3G3.
3G4.
3G5.

3G. Review executed road agreement with emphasis on:

3G1. Procedures for temporary road closure, including policy for notifying county sheriff & county engineer prior to necessary road closures

3G2. Permitting process

3G3. Requirements for contractor to report on delivery progress/schedule

3G4. Requirements for dust control on gravel roads

3G5. Developer's responsibilities for road damage repair

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- [4A.](#) <
- [4B.](#)
- [4C.](#)
- [4D.](#)

4A. Issue moving permits.

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4A.
4B. <
4C.
4D.

4B. County should treat project similar to other construction projects (i.e., regular site visits and documentation)

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STAGE 4: Construction

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4A.
4B.
4C. <
4D.

4C. County monitors items in road agreement and traffic plan

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4A.
4B.
4C. <
4D.

4C. Detail: Monitor Items in Road Agreement and Traffic Plan

Examples of what to look for:

- 1. Mud on the roads – make sure contractors clean it off.
- 2. Compliance with MMUTCD or other previously agreed-upon signage system.
- 3. Roadway surface condition to determine if required maintenance and repairs and have been done.

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STAGE 4: Construction

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- 4A.
4B.
4C.
4D. <
- 4D. Conduct scheduled, weekly meetings with developer

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STAGE 5: Post-Construction Meeting

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[5A.](#) <

5A. Post-construction meeting to discuss final inspection, damages, and repair costs

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STAGE 6: Operations and Maintenance

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6A. <

6A. Agree on policies to protect roads and to compensate for road damage as towers are repaired and during ongoing operation and maintenance

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STAGE 7: Decommissioning

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[7A.](#) <

7A. Agree on policies to protect roads and to compensate for road damage

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Compilation of All Sample Documents and Links:

- **Typical LWECS application to the PUC: Lakefield Wind Project, Jackson County, MN** [\[Download\]](#)
- **List of permitted wind energy projects in Minnesota since 1995, including project name, project size, and location (county):**
<http://energyfacilities.puc.state.mn.us/Docket.html?searchSubject=Wind+power&searchStatus=permitIssued&searchCoverage=&B1=Submit>
- **List of proposed projects in Minnesota that are in the permitting process as of April 2010:**
<http://energyfacilities.puc.state.mn.us/Docket.html?searchSubject=Wind+power&searchStatus=openProjects&searchCoverage=&B1=Submit>
- **Dekalb County, Illinois - Road agreement** [\[Download\]](#)
- **Dodge County, Minnesota, crane crossing requirements** [\[Download\]](#)
- **Jackson County, Minnesota, driveway permit application** [\[Download\]](#)
- **Jackson County, Minnesota, moving permit application** [\[Download\]](#)
- **Jackson County, Minnesota, radius extension permit application** [\[Download\]](#)
- **Jackson County, Minnesota, utility permit application** [\[Download\]](#)
- **Klickitat County, Washington, wind development policy and agreement:** [\[Download\]](#)
- **Lee County, Illinois, road agreement** [\[Download\]](#)
- **Lincoln County, Minnesota, driveway application / policy** [\[Download\]](#)
- **Logan County, Illinois, road agreement** [\[Download\]](#)
- **Logan County Illinois road agreement Exhibit A: Haul Route Map** [\[Download\]](#)
- **Logan County, Illinois, road agreement, Exhibit B: Road Reshaping Requirements** [\[Download\]](#)
- **Logan County, Illinois, zoning ordinance, Appendix E:** [\[Download\]](#)

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SAMPLE DOCUMENTS

BEST PRACTICES: MANAGING INTERACTION BETWEEN LOCAL AUTHORITIES AND MAJOR TRAFFIC GENERATORS

First Steps | Preliminary Tower Locations | Pre-Construction Meeting | Construction | Post-Construction Meeting | Ops/Maintenance | Decommissioning

Compilation of All Sample Documents and Links:

- **Maine county (unnamed) wind energy development road agreement:** [\[Download\]](#)
- **McLean County, Illinois, road upgrade and maintenance agreement:** <http://co.mclean.il.us/boardnotes/>
- **Montana wind energy ordinance:** <http://data.opi.mt.gov/bills/mca/15/24/15-24-3004.htm>

“County Road Dept. to Receive \$100,000 from Wind Farm Impact Fees Payment,” August 19, 2008. [\[Download\]](#)

“Giant Shelby-Area Wind Farm Gears Up,” July 18, 2008. [\[Download\]](#)
- **Morrison, Wisconsin: Large and Small Wind Energy Facility Ordinance**, adopted May 13, 2008. [\[Download\]](#)
- **Murray County, Minnesota, wind energy ordinance** [\[Download\]](#)
- **Nicollet County Wind Energy Conversion Systems Ordinance**, August 2009: [\[Download\]](#)
- **New York local government laws/zoning provisions on wind energy:** [\[Download\]](#)
- **Nobles County, Minnesota, wind tower development agreement with EnXco** — includes Exhibit E: Road Use and Repair Agreement and Exhibit F: Public Drainage System Protection Agreement [\[Download\]](#)
- **Nobles County, Minnesota, irrevocable letter of credit** — include credit rating document for bank that issued the letter of credit [\[Download\]](#)
- **Nobles County, Minnesota, sample township agreement for wind farm development** [\[Download\]](#)
- **Oregon Department of Energy: Model Ordinance for Energy Projects**, July 2005. [\[Download\]](#)
- **Rock County, Minnesota, driveway ordinance** [\[Download\]](#)
- **Sodus Township, Lyon County, Minnesota wind farm development agreement** [\[Download\]](#)
- **Watsonwan County, Minnesota, driveway policy** [\[Download\]](#)

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